P62-10258

NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
400 MARYLAND AVENUE, SW, WASHINGTON 25, D.C.
TELEPHONES WORTH 2-4155 — WORTH 3-1110

FOR RELEASE: ON DELIVERY
1:00 P.M.
Tuesday, October 2, 1962

RELEASE NO. 62-209B

Address
by
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National Aeronautics and Space Administration

NORTHEAST COMMERCE AND INDUSTRY EXPOSITION
Boston, Massachusetts
October 2, 1962

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Knowing the particular interest of those attending this conference in the progress of business and industry in the Northeastern United States, it would appear useful for this occasion to discuss the relationship of the private industrial community, and our institutions of our National goals in space.

As Administrator of the National Aeronautics and Space Administration, my responsibility extends to the organization, administration, and supervision of the work of more than 24,000 government employees who in turn will be responsible during Fiscal Year 1963 for supervision of the expenditure of nearly $4 billion--something over $10 million a day. The sum of this work, paid for with these funds, now going forward in industry, in universities and in government installations all over the nation is a driving effort to achieve for the United States what President Kennedy has called "pre-eminence in space," and to maintain leadership in the field of aeronautics.

To achieve that objective we must learn to get to space through the air and to travel in space as we have learned to travel on the sea or in the air. We must develop what might be

termed space power--the capability to utilize space for every purpose which our national interest may require. And, to fulfill the directives established by the Congress, we must develop that competence in space for the benefit to the fullest extent possible of all our own people, and of all mankind.

Vast physical resources and a great pool of skilled manpower and brainpower are being brought to bear in this effort, and more will be required before we have achieved the President's goal of establishing the United States as the "leading spacefaring nation."

Occasionally, as I look back over the 20 months since I joined this effort, and the decisions which each day of our accelerating activity in space has required, I cannot escape thinking how greatly the tools of progress in this scientific and technological age differ from those of the past.

One of the great early scientific discoveries--that of the principle of buoyancy--was made by Archimedes with a great mind, but little equipment beyond his own body, and the water in his bath. The literature does not enlighten us as to whether he replaced his robe before he dashed forth to inform the world of his discovery. That was not important.

Our first great American scientist, Benjamin Franklin, established the fact that lightning is an electrical discharge, using a kite and a key--and, of course, a thunderstorm.

Or, to bring this more clearly in focus, Sir Isaac Newton discovered the principle of gravity from watching an apple fall from a tree.

Today, in our civilian space program alone, more than 50,000 professional scientists and engineers--in and out of the National Aeronautics and Space Administration--are at work for useful and productive purposes, in the task of overcoming gravity--which Newton discovered all by himself.

The point I am trying to emphasize is this: although creative individual effort is as important today as it has ever been, and the imagination and initiative of the individual remain the primary source of scientific and technological progress, the development and perfection of the complex equipment, the systems and subsystems, which are taking men into space and enabling them to do useful work and bring back new knowledge, are rarely, if ever, the work of single individuals.

Today, teams of talented and imaginative scientists and technicians are joined in each major technological achievement with science making major contributions to the perfection of technology.

We are emerging into the age of highly developed, thoughtfully organized, science-oriented industry. We are emerging also into what might be described as a more intellectual society.

During the years ahead, industries will survive, and regional economies will grow and prosper, substantially in proportion to their utilization of the scientific and technological progress which is made, and this utilization will come more easily, move naturally, and with greater certainty in those areas where basic research is valued and supported. Also involved, I am convinced, will be an appreciation of the need to follow a more knowledgeable intellectual leadership capable of focusing on innovation, the rapidly expanding areas of knowledge which add up to a more complete and detailed, and sometimes called sophisticated, view of the basic process of nature.

As one sample of what I have in mind, let me point out that scientists, like Dr. Vannevar Bush, have pointed to the progress of the past 10 years toward an almost complete understanding of the basic atomic processes, and have predicted that the progress now being made in the life sciences points to the achievement, within the next 10 years, of a similar almost complete understanding of the life processes. There are intellectual achievements of the highest order, and an essential ingredient of a leadership capable of policies and actions that will command a following.

Several years ago, the growing urgency of reorienting our basic business and industrial concepts became apparent to many of us who were in business in Oklahoma, and who were concerned with the future of the state. We organized--and not without considerable difficulty--the "Frontiers of Science Foundation of Oklahoma."

The evidence of increasing federal activity in research and development, and the inevitability of its continued growth, were then apparent. I must confess, however, the doubt that any of us foresaw that this federally sponsored activity would explode to a level of more than $12 billion this year, and added to that would be an increment of $5 billion from industry, making a total of $17-$18 billion for the nation.

In our effort to understand these forces, a group of ours flew to New England and visited your great laboratories and universities. We found out from you and your leaders what needed to be done, and we went home and started to work.

Oklahoma's "Frontier of Science Foundation" has become a highly successful effort to generate greater interest in, and appreciation of, science as a vital force in contemporary life and particularly, economic growth. It is state-wide, and touches all walks of life. It involves not only business, industrial, and educational leaders, but reaches down into the schools to stimulate and reward young people who are exercising their intellectual capacity. It offers particular motivation to talented young people to lay a foundation on which to develop their full potential.

The effects of this activity on education, on business and industrial leadership, and on the Oklahoma economy, were almost immediately apparent. In existence for six years, it has been and is being studied by several states and regions for possible application in other areas of the country.

Compared to the New England states, Oklahoma is very new--55 years old. But whether we live in a new or old state, the socio-economic changes which are going on around us cannot be overstressed if we are to answer, when opportunity knocks, and cope realistically with contemporary economic circumstances. These changes and the accelerating note of change, may be difficult for some traditionalists to accept, but they are nonetheless vital and apparent.

I read with great interest, recently, the comments of Dr. Daniel Bell, Associate Professor of Sociology at Columbia University, in a paper entitled, "The Post-Industrial Society." In part, this is what he wrote:

"If the dominant figures of the past 150 years have been the entrepreneurs, the businessmen, and the executives, the 'new men' are the research scientists, the mathematicians, the economists and the managers of the new computer technology. The dominant institutions of the new society--in the sense of providing the most creative challenge and enlisting its best talents--will be the intellectual institutions. The leadership of the new society will not rest with the businessmen or the corporation as we know it, but with the research corporations, the industrial laboratories, the experimental stations and the universities....."

"To say that the major institutions of the new society will be intellectual is to say that production and business decisions will have become largely routinized; that the crucial questions regarding the growth of the economy, and its balancing, will come from research; that decision-making, because of the intricately linked nature of the consequences, will have an increasingly technical character; and that the best talents in the society, and consequently the prestige and status structure, will be based in the research and scientific sectors."

This discussion implies that a corporation, or even a regional area, will remain effective, and prosper in this new age, only through the closest co-ordination between educational institutions and business and industry, with the institutional scientists feeding into the industrial stream the new knowledge which flows from a vast research and development effort.

But, in my view this would be quite incomplete and skewed dangerously in one direction unless this process also encompasses an effective means for a feedback into newly, more powerful intellectually oriented institutions from the entreprenurial mind of the practical businessman, the man who must take the risk for profit or loss, and his associate, the experienced engineer who must see that things--even new things, work and give service.

As this becomes more fully realized, those regions and businesses which are quickest to comprehend the significance of these changes, and move with this tide will be in the vanguard of progress and prosperity during the years immediately ahead.

Here in the Northeast you have an exceptional opportunity to develop the relationships between business and industry on the one hand, and the universities and research laboratories on the other, which effective competition will demand. You have great depth in your sources of intellectual leadership. You have already made great progress in the development of "space age" industries of which scientific research and development are the core, but which also require great precision in the manufacturing process.

Further progress in this direction cannot fail to insure that this area will continue to make increasing contributions to the achievement of our goals in space.

We in NASA are striving for broad-based participation in our activities by industry in all the 50 states. The mastery of space is a national undertaking, and we would make it truly national in its accomplishment.

More than 90 per cent of our effort is channeled through procurement from industry and non-governmental sources, and we have made a studied effort to insure effective competition for these awards. This includes competition not only between private contractors, but between our own field centers and non-governmental sources, for our program managers have the option, in awarding developmental work, of placing it within or without the organization wherever there is the greatest capability.

The effectiveness of this competition is evident in the extent of our work which is performed outside NASA--90 per cent, as I said a moment ago.

We have also taken other steps to insure that patterns will not become frozen; that major contracts will not become locked-in by single sources. Typical of these efforts was the establishment, for the assembly of our new very large boosters, of the Michoud Operations Plant as a government installation, operated under private contract. This will keep open for the future a continuous competition, stage-by-stage, on the work which is done there.

We are constantly seeking ways to improve the incentives for industry to provide maximum performance, and to evaluate past performance as a consideration in making future awards. This emphasis on technical competence again should have the effect of encouraging prime contractors to seek out superior contract skills, among companies of proven performance, rather than risk failure in the development of new areas of internal competence to perform tasks which they have not performed before.

Here in the Northeast--here in Boston--we have taken another step in our efforts to encourage competition. I refer to the establishment of a NASA office to supervise our contracts here and facilitate our utilization of the resources of this region. Evidence of the significance which we attach to this activity is the fact that one of our ablest men, Franklyn W. Phillips, who was a senior advisor to my very able predecessor, Dr. T. Keith Glennan, and my immediate assistant in Washington until he came here, has been placed in charge.

Mr. Phillips will be concerned with bettering NASA's use of resources related to the excellent universities in the area, as well as the industry. We recognize that much of the new industry created here since World War II is the direct result of an interplay between the scientific and engineering manpower pool which

is part of the environment of the universities in new fields of technology--particularly that of electronics.

NASA is striving, as I have suggested earlier, to create an environment in its program which will encourage further useful relationships between the universities and industry, and provide more rapid transfer of the results flowing from advanced technological development into the total economy.

Let me emphasize that we, or any governmental agency, can help create an environment in which these things will take place only to the extent that the leaders in the region want them to take place and take the actions which only they can take. A full application and utilization of the benefits of any program, even one as broad as the space program, remains the responsibility of teams of leaders in every community.

No one could come to New England without a sense of real urgency on the part of New England to make the most of these opportunities. This Northeastern Commerce and Industry Exposition is obviously a step in this direction.

Development and utilization of regional capabilities will involve effort to match industry and talents and capacity to NASA's requirements. This can bring the seller and the buyer together under good market conditions, but the space program is a highly competitive one, and the seller must be prepared to compete to the fullest.

We want your help. Our procurement people, and our new office here, will show you how to compete. But they cannot compete for you. That you will have to do for yourselves.

Your success in this competition will be determined entirely by what you have to offer. We have a job to do and we mean to do it. We mean to do it as effectively, as efficiently, as rapidly and as economically as we can. Proven technical competence must always be the primary consideration in the award of NASA work, and, together with the other factors mentioned, will determine where, and by whom, the work will be done.

Just as business has its profit and loss statement to judge how it is doing, we have our own way of judgment--whether the rockets provide the power to boost our spacecraft out to orbit or beyond, and how well the spacecraft itself does its work. Increasingly, to answer some of the questions asked by the press

this morning, prime contractors, to meet this unambiguous test of success or failure, will come to New England if with your help they can do a better job and take less risks of failure.

Beyond these matters it should be pointed out that as competence developes throughout the nation in the new and complex fields which are involved, we will be confronted increasingly with situations in which several contractors of almost equal competence may be in competition.

As responsible government officials, once the performance requirements of our activity have been met, we have an obligation to consider other questions of low and national interest in making contract awards.

These would include questions involving regional economic conditions, employment, problems of small business, and other concerns of similar nature.

But let me repeat: these considerations must and will be secondary to our major responsibility--the utilization of our nation's financial and human resources to insure, most effectively, that the United States will achieve real and enduring superiority in space.

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